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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/935,692	08/24/2001	Hirosumi Suzuki	109676	9657

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EXAMINER	
JARRETT, SCOTT L	

ART UNIT	PAPER NUMBER
3623	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/935,692	SUZUKI ET AL.	
	Examiner	Art Unit	
	Scott L. Jarrett	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 August 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/24/01, 11/15/02*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figure 2 contains a grammatical error, "cash" instead of the intended "cache" for elements 46 and 48. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Title

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: System and Method for Optimizing the Number and Mix of Worker Types for Work Stations and Across Production Lines.

Claim Objections

4. Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kintner et al., U.S. Patent No. 6,732,079, in view of Giles et al., Meeting customer demand through mixed-model manufacturing (1997) and further in view of Schroer et al., Continuous process improvement the Quick Step way (1998).

Regarding Claims 1, 12 and 13 Kintner et al. teach a method and system for determining the optimal (i.e. lowest cost) mix (balance, ratio, percentage, etc.) of different workforce types (full-time, contract, etc.) to meet demand (supply volume, work load forecast, workload requirement) in a manufacturing/production environment (Abstract; Column 2, Lines 23-55; Column 3, Lines 16-24)

More specifically Kintner et al. teach a method and system for drafting (creating, generating, simulating, estimating, forecasting, etc.) a supply plan ("minimum-cost plan to meet workforce requirements", Column 3, Lines 60-61) for producing (manufacturing, assembling, etc.) an article/service (material, part, component, resource, product, etc.) comprising:

- storing resource (unit supply) man-hour data: time required to supply the resource (article, service, etc.) per unit; workforce required to supply the resource per

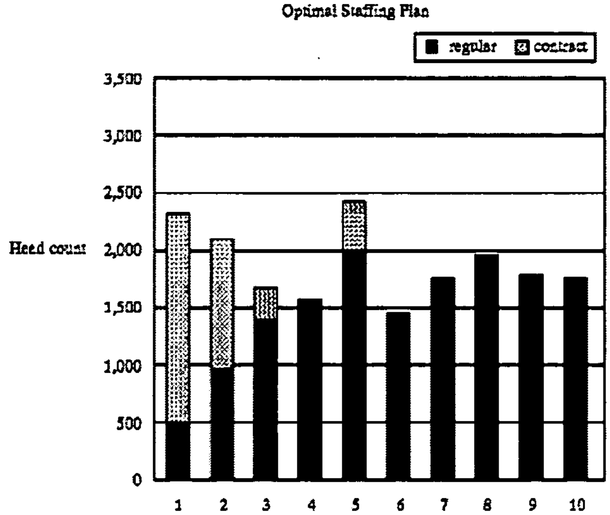
unit and work-force type (employee, temporary employee, contractor, etc.) cost per unit (Column 2, Lines 56-68; Column 4, Lines 41-68; Column 9, Lines 5-10; Tables 1-2);

- inputting a required supply volume (workload requirement, demand, etc.; Column 9, Lines 5-10 and 50-56; Tables 3-4);
- calculating the gross cost based on the work-force-type cost data (Table 10);
- successively changing (optimizing) workforce size and mix (linear programming; Column 3, Lines 25-40); and
- selecting a workforce size and mix corresponding to a minimum gross cost ("determine the low cost population combination of each type of worker to accomplish the work output for each period.", Column 3, Lines 16-24; Column 3, Lines 56-68).

TABLE 10-continued

Linear Programming Output for Specific Example

Optimal Staffing Plan



	Year	0	1	2	3	4	5	6	7	8	9	10
Contract Staff	Hire		1,750	26	—	—	415	—	—	—	—	—
	Terminate		—	—	600	205	—	249	—	—	—	—
	Quit		—	700	220	51	—	166	—	—	—	—
	Total	0	1,750	1,076	256	—	415	—	—	—	—	—
	Total Staff	0	2250	2042	1659	1580	2406	1485	1794	1964	1811	1795
Total Costs ($M)	Hire	0	49	12	11	6	20	—	9	6	—	1
	Terminate	0	—	—	—	—	—	9	—	—	1	—
	Annual	0	191	148	91	77	138	74	90	101	97	100
	Total	0	240	160	102	83	158	83	99	107	98	101

Kintner et al. does not expressly teach that the production line comprises a plurality of supply stations or subsequently distributing the required supply volume to individual stations, calculating for a station the time (supply man-hour) required to supply, calculating the gross cost for the supply station or selecting a distribution parameter corresponding to a minimum gross cost as claimed.

Giles et al. teach a system and method for designing a supply/production production line comprising of a plurality of stations/stages, shifts and workers comprising:

- determining/setting required supply volume (designed daily rate = targeted monthly volume/# of workdays per month; Column 2, Paragraph 1, Page 83; Column 2, Paragraphs 2-3, Page 85); and
- calculating for a production line the time (supply man-hour) required to supply (process) the resource ("Efficiency of the Proposed Line", Page 83; Operational Cycle time, takt time, Column 2, Paragraphs 2-3, Page 83; Equations 1-3, Page 83; Column 2, Paragraphs 2-3, Page 85).

Giles et al. further teaches method's the ability to increase/decrease the number/size/role of a workforce on a particular line provides greater manufacturing flexibility (Column 1, Last Paragraph, Page 86; Column 2, Paragraph 1, Page 86).

More generally Giles et al. teach the well-known utilization of mixed model production lines (i.e. multiple products/articles on a single production/manufacturing line) and Demand Flow Manufacturing/Technology (Pages 82, 85).

It would have been obvious to one skilled in the art at the time of the invention that the method and system for determining the optimal size/mix of a production workforce as taught by Kintner et al. would have benefited from calculating operational cycle time (supply man hour) and costs for a plurality of supply/work stations across several production lines in view of the teachings of Giles et al.; the resultant system/method enabling users to implement/provide flexibility in the production plan by changing/varying the number, mix/blend and role of workers on the plurality of workstations (Giles et al.: Column 1, Last Paragraph, Page 86; Column 2, Paragraph 1, Page 86).

Schroer et al. teach a method for optimizing production for a plurality of production lines comprising a plurality of workstations comprising:

- distributing the required supply volume to individual station supply volumes based on a distribution parameter (production-leveling, takt time; Column 1, Bullet 1, Page 86; Table 1, Figures 1-2);

- calculating for a station the time (supply man-hour) required to supply (process) the resource based on the station's distributed supply volume (Column 1, Paragraphs 2-4, Page 87; Figure 2);

- calculating the gross cost for the supply station to supply the distributed supply volume based on the work-force cost data (Column 1, Paragraphs 2-4, Page 87; "Phase IV, Page 88); and

- changing/selecting the distribution parameter and workforce parameter (Phase VII, Page 88).

More generally Schroer et al. teach a method for reducing cycle/operation time in a plurality of production lines utilizing a plurality of techniques/approaches including but not limited to production-leveling through the comparison of cycle time and takt time (takt time = available work time per day divided by the required demand in units per day; Table 1; Column 1, Bullet 1, Page 86).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing the workforce composition for a plurality of workstations and across several production lines as taught by the combination of Kintner et al. and Giles et al. would have benefited from optimizing the distribution of the required supply volume (demand) across each of the supply/work stations (e.g. production leveling, lowest cost) in view of the teachings of Schroer et al.; the resultant system/method reducing the cycle time to process/supply orders through the use of production leveling in which cycle times and takt times are compared/varied (Schroer et al.: Table 1, Column 1, Paragraph 2, Page 85).

Regarding Claims 2 and 14 Kintner et al. teach changing/varying the workforce parameter within a plurality of constraints (i.e. suppliable ranges; maximum head count, maximum number of employees, etc.; Column 9, Lines 60-68; Column 10, Lines 1-10; Constraint 2, Column 15; Constraint 5, Column 16; Table 5).

Kintner et al. does not teach a distribution parameter or subsequently wherein changing/varying a work/supply station distribution parameter within a suppliable range as claimed.

Giles et al. teach the utilization of several suppliable ranges as system/method constraints as well as the ability to plan for production line/work stations that exceed those ranges (extra shifts, work hours, etc.; Column 1, Last Paragraph, Page 83).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing the composition of a workforce on a production line as taught by Kintner et al. would have benefited from utilizing suppliable ranges/constraints generating the production plan in view of the teachings of Giles et al.; the resultant system/method enabling users to implement/provide flexibility in the production plan by changing/varying the number, mix/blend and role of workers on the plurality of workstations (Giles et al.: Column 1, Last Paragraph, Page 86; Column 2, Paragraph 1, Page 86).

Neither Kintner et al. nor Giles et al. teach a distribution parameter as claimed.

Schroer et al. teach distributing the required supply volume (demand) to individual work/supply stations based on a distribution parameter (Column 1, Bullet 1, Page 86; Table 1, Figures 1-2).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing the workforce composition for a plurality of workstations and across several production lines as taught by the combination of Kintner et al. and Giles et al. would have benefited from optimizing the distribution of the required supply volume (demand) across each of the supply/work stations (e.g. production leveling, lowest cost) in view of the teachings of Schroer et al.; the resultant system/method reducing the cycle time to process/supply orders through the use of production leveling in which cycle times and takt times are compared/varied (Schroer et al.: Table 1, Column 1, Paragraph 2, Page 85).

Regarding Claims 3 and 15 Kintner et al. teach a system and method for determining an optimal workforce composition/mix wherein:

- the workforce includes regular and irregular ranges (Column 9, Lines 60-68; Column 10, Lines 1-10; Constraint 2, Column 15; Constraint 5, Column 16; Table 5); and

- the work-force-type cost data includes regular and irregular cost data (Column 2, Lines 40-68; Column 4, Lines 42-68).

Knitner et al. does not teach workstation suppliable ranges as claimed.

Giles et al. teach the utilization of several suppliable ranges and the ability to enable the production/manufacturing to exceed those ranges (i.e. extra shits, extended working hours, etc.; Column 1, Last Paragraph, Page 83).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing the composition of a workforce on a production line as taught by Kintner et al. would have benefited from utilizing suppliable ranges/constraints generating the production plan in view of the teachings of Giles et al.; the resultant system/method enabling users to implement/provide flexibility in the production plan by changing/varying the number, mix/blend and role of workers on the plurality of workstations (Giles et al.: Column 1, Last Paragraph, Page 86; Column 2, Paragraph 1, Page 86).

Regarding Claims 4 and 16 Kintner et al. dos not expressly teach the use of that the irregular suppliable range includes overtime and holiday ranges as claimed.

Official notice is taken that applying/utilizing planning constraint/ranges such as overtime and holidays (suppliable ranges; e.g. amount of overtime available, allowable, etc.; length and timing of holidays) is old and very well known. These workforce ranges/constraints identify acceptable and/or physical limits to the availability of a workforce and help to ensure a workforce plan does not exceed those limits (e.g. scheduling a resource/workforce element to work 25 hours in a single day).

It would have been obvious to one skilled in the art at the time of the invention that the method and system for drafting a supply plan comprising an optimized mix of worker-types as taught by the combination of Kintner et al., Giles et al. and Schroer et al. would have benefited from taking into account overtime and holiday workforce

parameters constraints (suppliable ranges) in view of the teachings of official notice; the resultant system ensuring the production plan does not schedule/plan production outside of available ranges (e.g. over scheduling a worker).

Regarding Claims 5 and 18 Kintner et al. teach a system and method for determining an optimal workforce population mix wherein changing the workforce parameter includes changes to the ratio (mix) of work-force-types (Column 3, Lines 16-24 and 56-68; Column 4, Lines 1-7; Table 10).

Regarding Claims 6 and 19 Kintner et al. teach a system and method for determining an optimal workforce population mix wherein the work-force-types include regular employees and a plurality of temporary employees and the workforce parameter includes changes to the ratio/mix of regular and temporary (contract) employees (Column 3, Lines 16-24 and 56-68; Column 4, Lines 1-7; Table 10).

Regarding Claims 7 and 20 Kintner et al. teach changing/optimizing the mix of workforce-types in a production/manufacturing process however Kintner et al. does not expressly teach changing the workforce parameter at each of the supply stations as claimed.

Giles et al. teach optimizing the production of a material/production utilizing a plurality of work/supply stations wherein changes to a workforce parameter include

changes to the workforce (e.g. size, role, type, etc.) as discussed above; wherein the workforce parameter is varied in order to provide a flexible production plan (Column 1, Last Paragraph, Page 86; Column 2, Paragraph 1, Page 86).

It would have been obvious to one skilled in the art that the system and method for optimizing the composition of a production workforce as taught by Knitner et al. would have benefited from optimizing the distribution of supply volume to a plurality of workstations as well as varying the workforce composition (size, role, type) in view of the teachings of Giles et al.; the resultant system providing a flexible workforce/resource production plan through variations/optimization of the number/size, type and role of the workforce/resources (Giles et al.: Column 1, Last Paragraph, Page 86; Column 2, Paragraph 1, Page 86).

Regarding Claims 8 and 21 Kintner et al. teach a method and system for generating an optimal blended workforce wherein the workforce parameter changes include changes to a gross workforce in the supply stations that is within a workforce changeable range (maximum head count, maximum number of employees, etc.; Column 9, Lines 60-68; Column 10, Lines 1-10; Constraint 2, Column 15; Constraint 5, Column 16; Table 5).

Kintner et al. teach changing/varying the workforce parameter within a plurality of constraints (i.e. suppliable ranges; maximum head count, maximum number of

employees, etc.; Column 9, Lines 60-68; Column 10, Lines 1-10; Constraint 2, Column 15; Constraint 5, Column 16; Table 5).

Kintner et al. does not teach that the production line comprises a plurality of work/supply stations or subsequently a changeable range for the supply stations as claimed.

Giles et al. teach the utilization of several suppliable ranges as system/method constraints as well as the ability to plan for production line/work stations that exceed those ranges (extra shifts, work hours, etc.; Column 1, Last Paragraph, Page 83).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing the composition of a workforce on a production line as taught by Kintner et al. would have benefited from utilizing suppliable ranges/constraints generating the production plan in view of the teachings of Giles et al.; the resultant system/method enabling users to implement/provide flexibility in the production plan by changing/varying the number, mix/blend and role of workers on the plurality of workstations (Giles et al.: Column 1, Last Paragraph, Page 86; Column 2, Paragraph 1, Page 86).

Regarding Claims 9, 17 and 22 Kintner et al. teach changing/optimizing the workforce parameter for predetermined periods and/or selected planning horizons

implicitly required the re-optimization of the workforce composition for each period/planning horizon (Column 3, Lines 60-68).

Kintner et al. does not expressly teach changing the workforce and/or distribution parameters at a predetermined interval as claimed.

Neither Kintner et al. nor Giles et al. teach a distribution parameter as claimed.

Schroer et al. teach distributing the required supply volume (demand) to individual work/supply stations based on a distribution parameter (Column 1, Bullet 1, Page 86; Table 1, Figures 1-2).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing the workforce composition for a plurality of workstations and across several production lines as taught by the combination of Kintner et al. and Giles et al. would have benefited from optimizing the distribution of the required supply volume (demand) across each of the supply/work stations (e.g. production leveling, lowest cost) in view of the teachings of Schroer et al.; the resultant system/method reducing the cycle time to process/supply orders through the use of production leveling in which cycle times and takt times are compared/varied (Schroer et al.: Table 1, Column 1, Paragraph 2, Page 85).

Official notice that re-generating/updating production plans (supply plans) at regular predetermined intervals is old and well known. For example it is common for manufacturing companies to "re-optimize" / "re-plan" on daily, monthly and/or yearly basis based on a plurality of factors including but not limited to the predictability/volatility of demand such re-planning enabling businesses to regularly/periodically ensure they are operating/producing optimally.

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing a blended workforce across a plurality of workstations in several production lines as taught by the combination of Kintner et al., Giles et al. and Schroer et al. would have benefited from periodically/regularly re-optimizing/re-planning the production plan in view of the teachings of official notice; the resultant system enabling businesses to regularly/periodically ensure they are operating/producing optimally.

Regarding Claims 10 and 11 Kintner et al. does not expressly teach that the production line comprises a plurality of supply stations as claimed.

Giles et al. teach a method for designing an optimal production line comprising of a plurality of work stations/stages wherein:

- the supply stations are production lines for production the resource (i.e. stations offer a predetermined service; Column 1, Page 82; Page 83); and

- unit supply data is the workforce and time required to produce a single article (Equations 1-3).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing the composition of a production workforce as taught by Kintner et al. would have benefited from optimizing a production line comprising a plurality of supply stations in view of the teachings of Giles et al.; the resultant system/method enabling users to implement/provide flexibility in the production plan by changing/varying the number, mix/blend and role of workers on the plurality of workstations (Giles et al.: Column 1, Last Paragraph, Page 86; Column 2, Paragraph 1, Page 86).

Regarding Claim 23 Kintner et al. teach a system and method for drafting (creating, generating, simulation, estimating, etc.) a production plan for production an article in a plurality of product lines including a plurality of operating days comprising:

- allocating (distributing, assigning, etc.) a planned production volume to production lines (workload requirements, forecast; Column 2, Lines 24-55; Column 9, Lines 5-10; Table 3);

- calculating the number of workers (workforce) required for each production line based on the operating time (productivity; Table 10);

- calculating a personnel cost for each production line based on worker categories having different wages (e.g. regular vs. temporary employees; Column 3, Lines 16-24 and 56-68; Column 4, Lines 43-68); and

- calculating a minimum personnel cost while adjusting the number of workers for each worker category/type (Column 3, Lines 16-24 and 56-68; Columns 15-16).

Kintner et al. teach the generation an optimal-cost (lowest cost) blended workforce as discussed above (i.e. calculating a minimum personnel cost).

Kintner et al. does not expressly teach calculating an operating time (supply time, work time) for each production line corresponding to/based on a tact (takt) time as claimed.

Giles et al. teach calculating an operating time (supply time, work time) for each production line corresponding to/based on a tact (takt) time ("Efficiency of the Proposed Line", Page 83; Operational Cycle time, takt time, Column 2, Paragraphs 2-3, Page 83; Equations 1-3, Page 83; Column 2, Paragraphs 2-3, Page 85).

Giles et al. further teaches adjusting the (takt, pace) time and planned production volume allocated to each production line as discussed above.

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing the composition of a workforce in a production line as taught by Knitner et al. would have benefited from calculating an

operating time (supply time, work time, etc.) for each production line corresponding to/based on a takt time in view of the teachings of Giles et al.; the resultant system/method enabling users to implement/provide flexibility in the production plan by changing/varying the number, mix/blend and role of workers on the plurality of workstations (Giles et al.: Column 1, Last Paragraph, Page 86; Column 2, Paragraph 1, Page 86).

Neither Kintner et al. nor Giles et al. nor Schroer et al. teach calculating a gross personnel cost for all the production lines by summing up the cost of the individual production lines as claimed.

Official notice is taken that calculating a sum by summing up individual components is old and very well known. For example if a business wishes to determine the total production for a given set of production lines they can simply add/sum up the production (output) for each of the individual production lines into a total.

It would have been obvious to one skilled in the art at the time of the invention that the system and method for optimizing the composition of a workforce for a plurality of production lines comprising of a plurality of work/supply stations as taught by Kintner et al., Giles et al. and Schroer et al. would have benefited from calculating a gross personnel/workforce cost by summing up the personnel costs for each of the individual

production lines in view of official notice; the resultant system providing businesses with the total personnel/workforce cost for the plurality of production lines.

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kintner et al., U.S. Patent No. 6,732,079, in view of Giles et al., Meeting customer demand through mixed-model manufacturing (1997) and further in view of Schroer et al., Continuous process improvement the Quick Step way (1998) as applied to claims 1-23 above, and further in view of Kiritsis et al., Petri net techniques for process planning cost estimation.

Regarding Claim 24 Kintner et al. does not expressly teach calculating costs utilizing a Petri net model as claimed.

Kiritsis et al. teach cost estimation in manufacturing/production processes utilizing Petri net model (Process Planning Cost system, Process Planning Net) wherein "In order to determine the overall costs for feasible process plans, we take into account in our Petri net model of manufacturing process planning the costs caused by machine, setup and tool changing in addition to pure operation cost" (Abstract).

Kiritsis et al. further teaches that the Petri net model approach takes "into consideration processing alternatives" (e.g. different worker types; Abstract).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for drafting a production plan as taught by the combination of Kintner et al., Giles et al. and Schroer et al. would have benefited from modeling (calculating, determining, estimating, etc.) production costs in view of the teachings of

Kiritsis et al.; the resultant system enabling users to account for costs based on processing alternatives (Kiritsis et al.: Abstract).

Examiner's Note

The invention, as disclosed in the instant application, is directed to the development of a cost-optimal production plan for a plurality of production lines comprising a plurality of workstations via the periodic optimization of the size and composition of a workforce required to meet a required production/supply volume wherein the optimization parameters comprise workforce types/categories (number and composition), takt time, workforce service duty (holiday, overtime) and workforce type/service duty priorities (preferences) at the workstation level utilizing a Petri net cost model.

The instant application may disclose patentable subject matter however not all of the disclosed potentially patentable subject matter is recited in the claims. An interview with the examiner may be productive.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Tanaka et al., U.S. Patent No. 5,615,138, teach a system and method for calculating an operating time (man-time) in a plurality of production lines (e.g. automotive assembly line).

- Chen et al., U.S. Patent No. 5,826,238, teach a system and method for allocating (distributing) supply (production, demand, etc.) volume to workstations (machines) in a production/manufacturing line.

- Rothschild et al., U.S. Patent No. 5,966,694, teach a method and system for determining (calculating) the cycle time cost (operational cost) for a plurality production lines.

- Yuri et al., U.S. Patent No. 6,249,715, teach a system and method for work and workforce optimization for a plurality of work stations in a plurality of production lines based on a plurality of factors including but not limited to different workers (skills, experience, etc.).

- Martin, Donald, U.S. Patent No. 6,259,959, teaches a system and method for determining the performance of a production/manufacturing line wherein the production line comprises a plurality of workstations (work centers) for which operational cycle times, capacity and utilization are determined.

- Villanova et al., U.S. Patent No. 6,459,946, teach a system and method for determining/calculating a workforce (operator) size/number based on supply/demand

data (manufacturing target), operating time and working time per operator. Villanova et al. further teaches that the workforce comprises a plurality of different types of workers (multi-profile).

- Ichikawa, Yoshimasa, U.S. Patent No. 6,795,742, teach a system and method for drafting (creating, generating) production plans for a plurality of production lines taking into account order volume and constraint conditions.

- Ishii, Tatshuhisa, U.S. Patent Publication No. 2004/0167652, teaches a system and method for distributing/allocation supply volume (tasks) to a plurality of workers.

- Sumitomo Wiring System, Ltd, JP 10261122 A, teaches a system and method for optimizing the distribution of work (supply volume, demand, etc.) amongst a plurality of workers based on individual worker characteristics.

- Toyota Motor Corp., JP 2002108434 A, teaches a system and method for drafting a production/supply plan of an article (product) in a plurality of supply stations comprising allocating supply/demand volume to a plurality of production lines, calculating operational/cycle times (supply man-hour) for a plurality of production lines and determining/calculating the number of workers needed; distributing/allocating the number of workers to a plurality of worker types and adjusting the number and distribution of worker types in the production lines until the total cost is minimized.

- Herer, Yale et al., Determining the size of the temporary workforce (1998) teaches a method for determining the size and mix (temporary, core, regular, irregular, contract, contingent, assignment, permanent, etc.) of a workforce in order to meet demand wherein business seek to determine the appropriate workforce to minimize

costs while meeting demand. Herer et al. further teaches that "an obvious alternative to temporary workers is overtime."

- Liker, Jeffery, Advanced Planning Systems as an Enabler of Lean Manufacturing (1999), teaches several tenets of Lean Manufacturing including but not limited to takt time, balanced operations and continuous as well as production leveling. Liker further teaches that a plurality of systems known as Advanced Planning systems enable manufacturers optimize production (i.e. production lines) wherein takt time is used to design and balance production (e.g. "work elements are assigned to individual operators to load them up to the takt time.").

Liker further teaches that APS systems are well suited for calculating takt times for the total line and for individual items and developing optimal plans for the system as takt time changes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott L. Jarrett whose telephone number is (571) 272-7033. The examiner can normally be reached on Monday-Friday, 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hafiz Tariq can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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